Claims

[1]   A medical image diagnosis support device, comprising:

an organ region setting means for setting the organ regions from the medical images of the subject being obtained by a medical imaging device;

a deformation calculating means for calculating the deformation degree of the organ regions being set by the organ region setting means;

a reference value storing means for storing the index of the deformation degree of the organ region as a reference value;

a lesion detecting means for detecting the existence of the lesion of the organ region from the result of comparing the reference value being stored by the reference value storing means with the deformation degree being calculated by the deformation degree calculating means; and

a presenting means for presenting the existence of the lesions of the organ region being detected by the detecting means to the examiner visually and/or auditorily.

[2]   The medical image diagnosis support device according to claim 1, wherein the deformation degree calculation means comprises:

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a means for detecting the bifurcation of the previously calculated organ region;

a means for creating the plurality of the cross-sections of the organ region being diverged by the bifurcation being detected by the detecting means; and

a distance calculating means for calculating the shortest distance of the opposed peripheral portion between each of the plurality of cross-sectional images being created,

and wherein the lesion detecting means detects the existence of a lesion in the organ region based on the shortest distance of the opposed peripheral portion between the plurality of the cross-sectional images being calculated by the distance calculating means.

[3] The medical image diagnosis support device according to claim 1, wherein the reference value storing means stores the plurality of templates according to the deformation degree of the organ region.

[4] The medical image diagnosis support device according to claim 1, wherein the deformation degree calculating means includes:

a cross-sectional image calculating means for calculating the cross-sectional images that are orthogonal to axial

direction of the organ region; and

an extracting means for extracting the lumen and the exterior of the organ region from the cross-sectional images being calculated from the cross-sectional image calculating means;

and calculates the degree of deformation of the lumen and the exterior of the organ region being extracted by the extracting means.

[5] The medical image diagnosis support device according to claim 1, wherein the deformation degree calculating means includes:

a means for extracting the hollow viscera out of the organ region being set by the organ region setting means;

a notable region setting means for setting the notable region of the hollow viscera being extracted by the extracting means; and

a means for creating the cross-sectional images of the hollow viscera being extracted by the extracting means based on the notable region being set by the notable region setting means,

and wherein the lesion detecting means detects the existence of the lesion of the organ region based on the deformation degree of the cross-sectional images of the hollow

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viscera being created by the creating means.

[6] The medical image diagnosis support device according to claim 1, wherein the presenting means presents the existence of a lesion to the examiner visually by displaying it through colors or movement in the display images.

[7] The medical image diagnosis support device according to claim 6, wherein the visual presentation to the examiner is executed by displaying the cross-sectional images of the organ regions being set by the organ region setting means, and by highlighting the lesion candidate portions being detected by the lesion detecting means on the cross-sectional images.

[8] The medical image diagnosis support device according to claim 1, wherein the presenting means presents the existence of a lesion to the examiner auditorily by outputting it through voices and sounds, or the variance of the voices and sounds.

[9] The medical image diagnosis support device according to claim 1 further comprises:

    a cross-section extracting means for extracting the cross sections from the feature quantity of the hollow viscera on the tomographic images being obtained by the medical imaging

device;

a physical quantity calculating means for calculating the physical quantity including the radius, degree of circularity, and gravity point of the hollow viscera on the hollow viscera cross-sections being extracted by the extracting means;

an ROI calculating means for calculating the region of interest based on the physical quantity being calculated by the physical quantity calculating means;

a 3-dimensional image creating means for creating the 3-dimensional images of the hollow viscera from the tomographic images including the cross sections of the hollow viscera being extracted by the cross section extracting means within the region of interest being calculated by the ROI calculating means; and

an image displaying means for displaying the 3-dimensional images being created by the 3-dimensional image creating means.

[10]   The medical image diagnosis support device according to claim 9 further comprises a center-line calculating means for calculating the center line of the hollow viscera based on the gravity point of the hollow viscera cross sections being calculated by the physical quantity calculating means, wherein the image display means displays the center line being calculated by the center-line calculating means together with

the 3-dimensional images being created by the 3-dimensional image creating means.

[11]   The medical image diagnosis support method comprises:

an organ region setting step for setting the organ region from the medical images of the subject being obtained by the medical imaging device;

a deformation degree calculating step for calculating the deformation degree of the organ region being set by the organ region setting step;

a reference value storing step for storing the index of the deformation degree of the organ region as a reference value;

a lesion detecting step for comparing the reference value being stored by the reference value storing step with the deformation degree being calculated by the deformation degree calculating step, and for detecting the existence of a lesion of the organ region from the result of the comparison; and

a presenting step for presenting the existence of a lesion to the examiner visually and/or auditorily.

[12] The medical image diagnosis support method according to claim 11, wherein the deformation degree calculating step includes:

a step for detecting the calculated bifurcation of the organ

region;

a step for creating the plurality of cross-section images of the diverged organ region by the bifurcation being detected by the previous step; and

a distance calculating step for calculating the shortest distance of the opposed periphery portion to the spacing between the plurality of cross-sectional images being respectively created,

and wherein the lesion detecting step detects the existence of the lesion of the organ region based on the shortest distance of the opposed periphery between the plurality of the cross-sectional images being calculated by the distance calculating step.

[13] The medical image diagnosis support method according to claim 11, wherein the reference value storing step stores the plurality of templates according to the deformation degree of the organ regions.

[14] The medical image diagnosis support method according to claim 11, wherein the deformation degree calculating step includes:

a cross-sectional image calculating step for calculating the cross-sectional images that are orthogonal to the axial

direction of the organ region; and

an extracting step for extracting the lumen and the exterior of the organ region from the cross-sectional images being calculated by the cross-sectional image calculating step,

and calculates the deformation degree of the lumen and the exterior of the organ region being extracted by the extracting step.

[15]   The medical image diagnosis support method according to claim 11, wherein the deformation degree calculating step includes:

a step for extracting the hollow viscera out of the organ regions set by the organ region setting step;

a notable region setting step for setting the notable region of the hollow viscera being extracted by the extracting step; and

a step for creating the cross-sectional images of the hollow viscera being extracted by the extracting step based on the notable region being set by the notable region setting step,

and wherein the lesion detecting step detects the existence of the lesion of the organ region based on the deformation degree of the cross-sectional images of the hollow viscera being created by the creating step.

[16]   The medical image diagnosis support method according to claim 11, wherein the presenting step presents the existence of a lesion being detected by the detecting step to the examiner visually through displaying it by color tinting and/or the movement on the image.

[17]   The medical image diagnosis support method according to claim 16, wherein the visual presentation to the examiner is executed by displaying the cross-sectional images of the organ regions being set by the organ region setting step, and by highlighting the lesion candidate portion being detected by the lesion detecting step on the cross-sectional images.

[18] The medical image diagnosis support method according to claim 11, wherein the presenting step presents the existence of a lesion being detected by the detecting step to the examiner auditorily through outputting it by voices and/or sounds, or the variance of voices and/or sounds.

[19]   The medical image diagnosis support method according to claim 11 further comprises:

a cross-sectional image extracting step for extracting the cross sections from the feature quantity of the hollow viscera in the cross-sectional images being obtained by the medical

imaging device;

a physical quantity calculating step for calculating the physical quantity including the radius, degree of circularity and gravity point of the hollow viscera on the cross-sectional image of the hollow viscera being extracted by the extracting step;

an ROI calculating step for calculating the region of interest based on the physical quantity being calculated by the physical quantity calculating step;

a 3-dimensional creating step for creating the 3-dimensional images of the hollow viscera from the cross-sectional images including the cross-section of the hollow viscera being extracted by the cross-sectional image extracting step within the region of interest being calculated by the ROI calculating step; and

an image displaying step for displaying the 3-dimensional images being created by the 3-dimensional creating step.

[20] The medical image diagnosis support method according to claim 19, further comprises the center line calculating step for calculating the center line of the hollow viscera based on the gravity point of the cross section of the hollow viscera being calculated by the physical quantity calculating step, wherein the image display step displays the center line being

calculated by the center line calculating step together with the 3-dimensional images being created by the 3-dimensional image creating step.